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ABSTRACT

Noting that a case-study approach can stimulate student thinking and learning, this paper describes how students in a writing-intensive course on parasitology wrote brief medical case studies of parasites already studied for other students to read, evaluate, and identify the parasite. The paper presents a brief description of the course, an outline of the case-study format, an original, uncoded version of a student-written case study, the same case study coded to identify key medical information in the case study, a table listing key terms used in identification of the parasite from the case study, and a list of 12 advantages of the case study writing exercise. (RS)

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"USE OF CASE STUDIES FOR STIMULATING THINKING AND LEARNING"

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"USE OF CASE STUDIES FOR STIMULATING THINKING AND LEARNING"

Biology 361, Parasitology, was taught using a writing intensive approach. The class consisted of 19 students (sophomores, juniors and seniors) majoring in biology, medical technology, pre-medicine, or other areas of allied health.

Students were assigned (as an out of class reading), the chapter on parasitic flukes (trematodes) from the course text. The chapter material was presented and discussed in class using a lecture-discussion format. Students were exposed to the subject material for the case study via lecture, laboratory and reading assignments.

The case-study consisted of a five-minute in class writing exercise. Students were asked to produce a case study dealing with a parasite (a fluke) that had already been studied. They were to present the writing as a medical case study, emphasizing symptoms, pathology, epidemiology and diagnostic features, in such a way that enough information would be provided for other members of the class to make a correct diagnosis. They were not to name the parasite described in their case study.

The case studies were collected, names removed, photocopied, and a booklet of all the case studies prepared for each student. The booklets were distributed to each student and they were asked to evaluate the other case studies (18 total) using a scale from 1-10 (10 being the highest). The criteria for evaluation were symptoms, pathology, epidemiology and diagnosis, along with the question of "Was enough information provided so that a correct diagnosis could be made?" They were also asked to name the parasite described in each of the case studies.

The case study approach to learning in the Parasitology class proved to be a very powerful learning experience. An example of the exercise will be presented along with the advantages for using this type of approach to stimulate student thinking and learning.

Critical Thinking
Collaborative Learning
Cognition
Creativity

Case Study Format

DISCIPLINE: **BIOLOGICAL SCIENCES**

CLASS: **PARASITOLOGY**

STUDENTS: **SOPHOMORES, JUNIORS, SENIORS (allied-health majors)**

SETTING: **Write a case-study dealing with one of the trematodes (flukes) we had studied. Present the writing as a medical case with emphasis on SYMPTOMS, PATHOLOGY, EPIDEMIOLOGY AND DIAGNOSIS in such a way that enough information would be provided for other members of the class to make a correct diagnosis. Do not name the parasite.**

CRITIQUE: **Collected the case-studies from the 19 students, cut off the names on each paper, photocopied them and prepared a booklet for each student of all case-studies. Handed out the booklets to each student during the next class and asked them to evaluate the other students' writing based on a scale of from 1-10 (ten being the highest).**

** **WAS ENOUGH INFORMATION PROVIDED FOR YOU TO MAKE A CORRECT DIAGNOSIS?**

ORIGINAL TYPEWRITTEN, CODED VERSION OF STUDENT CASE STUDY

Location: Vietnam

A young Vietnamese boy, who after suffering from fever and diarrhea was taken to the local health clinic. With no real laboratory equipments at the clinic to do a proper examination, you decided to keep the boy there for observation. After a week, the boy began having epigastric pain and that he had not been eating well. Now as the symptoms get worsed, you decided to sent out some of the boy's fecal materials to a hospital for examination. One and a half weeks later, the result of the fecal examination came back, indicating that there were numerous eggs of the trematode with an average size of 29 μm x 160 μm and some that were larger, around 35 μm x 200 μm. The eggs appeared to have an operculum and a small process at the abopercular end. However, the hospital was not able to identify the specific trematode that produced the eggs. But while you were waiting for the result, the boy began experiencing pain around the area of the liver and also appeared to be jaundiced. Now with the symptoms and eggs description in mind, you think you have an idea of the causative trematode. But you want to be sure, so you check on the boy's history before the onset of the symptoms and other members of his family. You discover that their diet consist of mainly vegetables and that almost every chore that the boy has done was with some other member of his family. But you do not hear any health compleints by his family. However, you were told that the boy had been eating a lot of fishes at a food stand. Now you know what the trematode that is causing the infections.

ORIGINAL TYPEWRITTEN, CODED VERSION OF STUDENT CASE STUDY

Location: Vietnam

A young Vietnamese boy, who after suffering from [1]fever and [1]diarrhea was taken to the local health clinic. With no real laboratory equipments at the clinic to do a proper examination, you decided to keep the boy there for observation. After a week, the boy began having [1]epigastric pain and that he had not been [1]eating well. Now as the symptoms get worsed, you decided to sent out some of the boy's [4]fecal materials to a hospital for examination. One and a half weeks later, the result of the fecal examination came back, indicating that there were numerous [4]eggs of the [4]trematode with an average [4]size of 29 µm x 160 µm and some that were larger, around 35 µm x 200 µm. The eggs appeared to have an [4]operculum and a small process at the [4]abopercular end. However, the hospital was not able to identify the specific trematode that produced the eggs. But while you were waiting for the result, the boy began experiencing [1]pain around the area of the [2]liver and also appeared to be [1,2]jaundiced. Now with the symptoms and eggs description in mind, you think you have an idea of the causative trematode. But you want to be sure, so you check on the boy's history before the onset of the symptoms and other members of his family. You discover that their diet consist of mainly [3]vegetables and that almost every chore that the boy has done was with some other member of his family. But you do not hear any health compleints by his family. However, you were told that the boy had been eating a lot of [3]fishes at a food stand. Now you know what the trematode that is causing the infections.

TABLE I

KEY TERMS USED IN IDENTIFICATION OF PARASITE FROM CASE STUDY

Code #1 SYMPTOMS	Code #2 PATHOLOGY	Code #3 EPIDEMIOLOGY	Code #4 DIAGNOSIS
Fever	Epigastric	Young Boy	Fecal
Pain (liver)	----------	----------	Eggs: average size 29 µm X 160 µm
Epigastric pain	Jaundice	Fish	----------
Diarrhea	Liver	Vegetables	Trematode
Not eating well	----------	----------	Operculum
Jaundice	----------	----------	Abopercular

ADVANTAGES OF THE CASE STUDY WRITING EXERCISE:

1. **Students were writing in their discipline.**
2. **Students were involved in evaluation-they were participants and spectators.**
3. **Students were using scientific terminology.**
4. **The exercise helped indicate what students understood.**
5. **The exercise helped indicate areas that I as a professor needed to clarify.**
6. **The exercise allowed students an opportunity to practically apply what they were learning.**
7. **The exercise did not involve a significant amount of out-of-class grading time for the professor.**
8. **The exercise involved the whole class--time was well spent because it involved interaction among all students.**
9. **Much of the responsibility for learning was given back to the student.**
10. **A simple writing exercise, it provides a very powerful learning experience because of the components and does not require a lot of"grading time" by the professor because everyone is included in the evaluation. Everyone is both student and teacher.**
11. **Students had to read and write and think---then apply.**
12. **The exercise simulated activities that students might experience in their future careers.**